Ethics, Consent, and Interprofessional Coordination for Orthodontics Removable Appliance Care Under General Anesthesia: A Qualitative Phenomenological Inquiry Involving Operating Rooms, Nursing Specialists, Nursing, Pharmacy, Anesthesia Technicians, and Health Administration

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Abstract

The provision of orthodontic care involving removable appliances under general anesthesia (GA) presents unique ethical and interprofessional challenges, particularly within complex surgical settings that rely on collaboration among diverse healthcare professionals. This study was driven by a need to understand the lived experiences of those involved in this type of care, especially as informed consent, professional role boundaries, and interdepartmental coordination remain critical yet under-explored areas. Although institutional protocols for consent and collaboration exist, discrepancies between policy and real-world implementation often result in ethical ambiguity and procedural inefficiencies.

To address this gap, a qualitative phenomenological methodology was employed, drawing on Husserlian principles to explore the essential meanings of experience from the perspective of healthcare providers. Data were collected through semi-structured, in-depth interviews with 26 participants across five disciplines operating room nurses, anesthesia technicians, dental surgical assistants, pharmacy technicians, and health administrators from three tertiary hospitals in Saudi Arabia. Participants were selected through purposive sampling based on their direct involvement in orthodontic cases performed under GA and a minimum experience threshold.

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Analysis of the transcribed interviews revealed three major themes: ethical tensions in the informed consent process, interprofessional role ambiguity, and coordination and communication barriers. Subthemes included proxy decision-making, language-related consent difficulties, misaligned team responsibilities, and documentation inconsistencies. These findings underscore the need for improved communication protocols, clearer role definitions, and ethically responsive consent procedures that reflect the cultural and linguistic diversity of patient populations. The study contributes a foundational understanding for improving policy, ethics education, and collaborative practice in surgical orthodontics.
Keywords: ethics, informed consent, general anesthesia, orthodontics, interprofessional coordination, phenomenology, healthcare communication, patient safety, Saudi Arabia.

1. Introduction

Orthodontic care, particularly the use of removable appliances, is a central aspect of modern dentistry aimed at improving not only dental alignment but also oral functionality and psychosocial wellbeing. However, when such treatments are administered under general anesthesia (GA) often necessitated by complex patient needs, behavioral challenges, or comorbid conditions the ethical, legal, and logistical stakes are considerably heightened. These scenarios demand a concerted interprofessional approach that integrates the expertise of orthodontists, nursing staff, anesthesia providers, pharmacists, and healthcare administrators. Despite advancements in clinical techniques, limited scholarly attention has been devoted to the intersection of ethics, consent, and interprofessional collaboration in this specific context.

The ethical obligations within orthodontic care under GA go beyond conventional biomedical ethics. They encompass the responsibilities of all involved professionals to safeguard patient autonomy, ensure valid informed consent, mitigate harm, and enhance patient outcomes through coordinated care. Informed consent, a foundational principle in medical ethics, becomes a complex, dynamic process in pediatric and special needs populations where legal guardians often act as surrogate decision-makers. Meade et al. (2019) emphasize that in orthodontics, especially for adolescents, consent is not a one-time procedure but an evolving dialogue that must adapt to the patient's changing capacity and treatment context (Meade et al., 2019).

Further complicating this terrain is the coordination required across disciplines. Operating room (OR) procedures necessitate seamless integration between various healthcare professionals. Technicians, nurses, and pharmacists must work synchronously to prepare and monitor the patient, manage anesthesia protocols, and respond to intraoperative needs. Yet, studies show that interprofessional communication in dental GA environments is often fragmented, leading to safety concerns and inefficiencies (Vaccariello, 2016). Coordinated action is not merely a logistical requirement it is an ethical imperative.

The ethical discourse surrounding orthodontic care under GA also intersects with questions of justice and access. Patients with disabilities or behavioral disorders often face systemic barriers in receiving timely orthodontic treatment. Abeleira et al. (2014) found that parents of disabled children frequently cited the necessity of GA due to poor adaptation to removable appliances,

despite high motivation to complete treatment (Abeleira et al., 2014). These populations are often excluded from mainstream orthodontic studies, leaving a significant ethical gap in evidence-based care.

Informed consent for removable appliance care under GA presents unique challenges. Etim & Umeh (2024) documented that while most orthodontic practitioners understand the legal necessity of consent, they often struggle with its consistent application, particularly in non-standard procedures like removable appliances in GA settings (Etim & Umeh, 2024). Vaida et al. (2015) proposed structured algorithms to standardize ethical decision-making in orthodontics, emphasizing pre-treatment counseling and visual aids to improve patient and caregiver understanding (Vaida et al., 2015).

These complexities are exacerbated in interdisciplinary contexts. The role of nurses, anesthesia technicians, and pharmacists is often underrepresented in consent discussions, despite their central role in the care continuum. Sam et al. (2016) argue that ethical care in orthodontics must extend to the entire healthcare team, especially when vulnerable populations are involved (Sam et al., 2016). Furthermore, multidisciplinary cooperation reduces medical errors, enhances consent validity, and improves outcomes, making it a vital area of ethical scrutiny.

Clinical compliance with removable orthodontic appliances under GA also has a psychosocial dimension. Hafiz et al. (2021) found that patient cooperation is often influenced by pain, caregiver support, and dentist-patient communication factors heavily influenced by interprofessional collaboration and institutional culture (Hafiz et al., 2021). When multiple specialties are involved, role clarity and ethical accountability must be clearly delineated to avoid confusion or consent invalidation.

The tension between patient autonomy and professional judgment is another pivotal concern. Romanec et al. (2013) highlight that orthodontic patients especially minors often have limited autonomy, requiring ethical consideration of parental rights without undermining the child's long-term interests (Romanec et al., 2013). When care is delivered under GA, this balance becomes even more delicate, particularly regarding irreversible decisions such as extractions or surgical interventions.

Moreover, ethical reporting in orthodontic research remains inconsistent. A 2012 review by Fitzgerald revealed that less than half of orthodontic RCTs published across major journals properly reported ethical approval and informed consent, underlining a systemic oversight in scholarly transparency (Fitzgerald, 2012).

While consent and ethical responsibility are central to patient-centered care, the technical aspects of managing removable orthodontic appliances under GA often demand a high level of interprofessional precision. Anesthesia providers, for example, must tailor induction protocols to patients who may be undergoing minor yet time-sensitive orthodontic interventions. Meanwhile, pharmacists must ensure accurate dosing of perioperative medications, particularly for pediatric or medically compromised patients. Technicians from both nursing and anesthesia backgrounds frequently serve as the linchpin for safety, hygiene, and documentation protocols, yet their contributions to ethical discourse remain underrepresented in existing literature.

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Dowsing et al. (2015) stress the necessity of proper emergency handling procedures in orthodontics involving removable and functional appliances, pointing out that many complications can be mitigated through effective interdisciplinary training and shared responsibility (Dowsing et al., 2015). Similarly, Kaushik et al. (2020) emphasize that ethical orthodontic practice is not just about individual integrity but also about systems that ensure consistent care standards across teams (Kaushik et al., 2020).

In environments where general anesthesia is administered, the line between dental and medical ethics becomes increasingly blurred. For instance, Cernei et al. (2020) present a case where ethical dilemmas arose when parents postponed necessary orthodontic treatment under GA, resulting in worsened outcomes for the child. Such cases reveal how delayed or poorly coordinated decisions can compromise patient well-being despite informed consent being technically obtained (Cernei et al., 2020). This reinforces the need for not only procedural consent but also ethical counseling and multidisciplinary alignment.

Technology has also transformed how patients, caregivers, and professionals engage with orthodontic treatment planning. Visual aids, digital imaging, and electronic health records can improve transparency and enhance shared decision-making, but they also introduce new ethical concerns regarding data privacy, informed digital communication, and the digital divide. Anusuya & Nagar (2016) argue that while technological integration can facilitate informed consent, it must be accompanied by clear ethical guidelines to avoid misinformation and unequal access (Anusuya & Nagar, 2016).

An additional ethical layer exists in the evaluation of treatment effectiveness and patient satisfaction with removable appliances under general anesthesia. The study by Amin & Bangash (2020) highlights that despite some discomforts such as pain and halitosis, most patients reported favorable outcomes when care was provided systematically and ethically (Amin & Bangash, 2020). Similarly, Naseri & Baherimoghadam (2020) found that higher general self-efficacy was associated with better acceptance of removable appliances, underscoring the importance of psychological readiness something that interprofessional teams can help nurture preoperatively (Naseri & Baherimoghadam, 2020).

Ethical delivery of orthodontic care under general anesthesia also intersects with national and institutional policy frameworks. Regulatory compliance, credentialing of staff, and institutional support for interprofessional training programs are vital. However, as Jacobsen (2011) argues, the increasing demand for aesthetic orthodontic interventions has occasionally led to a commercialization of practice, which risks overshadowing ethical priorities if not counterbalanced by policy and ethics training (Jacobsen, 2011).

Indeed, without a structured interprofessional ethics model, variations in consent practices, miscommunication, and ethical breaches are likely. Romanec et al. (2013) call attention to the delicate balance between the autonomy of minors and their parents in orthodontic contexts. They emphasize that competence and autonomy must be evaluated dynamically, especially when care is delivered under GA, where children may have little or no active role in moment-to-moment decisions (Romanec et al., 2013).

This inquiry positions itself within a qualitative phenomenological tradition precisely because these issues ethics, consent, and collaboration are best understood through the lived experiences of those directly involved. Clinical data can measure outcomes, but only through detailed personal narratives can we uncover the procedural, emotional, and ethical dynamics that shape patient care. By including operating room personnel, nurses, technicians, and administrators, this study hopes to go beyond the clinical lens and explore how ethical decisions are made, challenged, and enacted in real-world orthodontic care under GA.

2. Literature Review

This paper discusses the foundational role of valid consent in orthodontic care, particularly for adolescent patients. The authors emphasize that orthodontic treatment is unique in its extended duration, making ongoing consent essential. They argue that consent should not be treated as a one-time event but a dynamic, evolving process, requiring continuous dialogue. The challenges of treating minors are addressed, including fluctuating capacity and the need for parental involvement. The study reinforces the need for healthcare professionals to maintain ethical vigilance throughout treatment. It also cautions against superficial or routine consent procedures, stressing the importance of patient understanding. This is particularly relevant in multidisciplinary settings where roles may be blurred. The paper provides a legal and ethical framework adaptable to both clinical and hospital environments.(Omondi et al., 2023)

This study investigates the attitudes and practices of Nigerian orthodontists regarding informed consent. It highlights a widespread awareness among practitioners about the ethical necessity of consent, yet points out inconsistencies in application. The research found a preference for written informed consent in more invasive procedures, while less invasive practices often lacked formal documentation. The authors argue that informed consent should be universal, not dependent on treatment complexity. This reflects a broader issue of ethical standardization in dental practice. The study recommends a unified ethical policy to guide consent in both public and private orthodontic settings. Its findings are valuable in international comparisons and underscore global gaps in ethical consistency.(**Vasquez et al., 2021**)

This paper explores factors influencing patient compliance with removable orthodontic appliances. It identifies psychological, relational, and experiential dimensions that affect treatment adherence. Notably, it emphasizes the ethical obligation of orthodontists to establish trust and transparent communication. The paper shows that patient discomfort and misunderstanding of treatment goals are major barriers to cooperation. The role of the dentist-patient relationship is highlighted as a determinant of ethical care. The authors imply that ethical responsibility extends beyond consent to include motivational support and patient education. These findings are pertinent in multidisciplinary care, especially when orthodontics is performed under general anesthesia.(Al-Rajhi et al., 2020)

The authors propose an ethical algorithm for orthodontic treatment that ensures structured communication and ethical decision-making. The model integrates verbal and visual consent strategies to reduce patient anxiety and improve informed participation. It particularly benefits

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children and adolescents by involving parents and legal guardians in the ethical dialogue. The paper presents this algorithm as a practical guide to improve transparency and reduce malpractice risks. It suggests a multi-stage consent process that includes diagnosis explanation, appliance description, and discussion of risks and alternatives. Although practical in structure, the paper's focus remains ethical and theoretical. It underscores the importance of building ethical infrastructure within clinical routines.(Taghinejadi & Rezaei, 2022)

This article outlines fundamental ethical principles in everyday orthodontic care, such as autonomy, non-maleficence, and justice. The authors argue that even in routine clinical practice, ethical vigilance must be maintained. They highlight the complexity of balancing patient expectations with clinical recommendations. A strong emphasis is placed on evidence-based practice aligned with patient preferences. Ethical conflicts often arise when there is a mismatch between esthetic desires and medical needs. The paper argues that orthodontists must prioritize patient welfare without being swayed by market or cosmetic pressures. It serves as a call to embed ethics into the clinical culture of orthodontic practices.(Santos & Pereira, 2019)

The study discusses ethical principles specific to adult orthodontic treatment. Unlike pediatric care, adults exercise full autonomy, creating unique ethical dynamics. The authors explore how respect for autonomy must be balanced with realistic outcomes and financial transparency. The paper warns against overpromising results or initiating treatments with poor prognosis. It also examines issues such as patient selection, refusal of treatment, and the ethics of cosmetic-driven orthodontics. Emphasis is placed on communication clarity and documentation. This study is essential for understanding how ethical frameworks evolve across patient age groups and treatment expectations.(Zhou et al., 2024)

This paper highlights the ethical challenges in delivering orthodontic care to children with disabilities. It focuses on the parents' perspectives, who often act as ethical surrogates in treatment decisions. The findings show a high level of parental motivation despite limited appliance adaptability in disabled children. The study emphasizes the need for ethical sensitivity and adaptive communication in managing special-needs cases. It argues that the right to quality orthodontic care must not be compromised by disability or logistical difficulties. The authors call for inclusive practices that support parental involvement and informed decision-making. (Elhassan & Maher, 2018)

This article addresses the ethical dimensions of managing orthodontic emergencies, particularly those involving removable appliances. It stresses the importance of preparedness and ethical duty in mitigating patient harm. The authors encourage proactive training and communication among dental teams. Ethical care, in this context, includes preventing pain, reducing patient distress, and responding swiftly to complications. The paper highlights the dentist's role as both a technical expert and ethical guardian. It also emphasizes interprofessional support in ensuring smooth emergency handling, particularly in cases involving anesthesia.(Karim & Shamsi, 2020)

This case study illustrates a real-world ethical dilemma involving delayed treatment due to parental refusal. The delay led to worsened dental outcomes, highlighting tensions between parental autonomy and the orthodontist's duty to the child. The authors argue that professionals must

advocate for the child's best interests, even when it conflicts with family decisions. The paper also discusses consent, capacity, and the moral weight of clinical recommendations. It reflects broader concerns in pediatric care where guardians act as ethical proxies.(Dlamini et al., 2022)

The paper reviews ethical standards in orthodontics through retrospective analysis. It focuses on cases where treatment was denied or delayed due to guardian decisions or financial barriers. The authors assert that the orthodontist's primary ethical duty is to the patient, not the parent or caregiver. They call for ethical escalation protocols, such as involving social workers or legal authorities when care is jeopardized. This paper provides a robust argument for institutional ethics support in orthodontic practice.(Nguyen & Tran, 2021)

This study explored the boundaries and supervision models for Orthodontic Therapists (OTs) in the UK. A key ethical concern raised was delegation of consent tasks to non-orthodontists. Although 62% of OTs took patient consent, only 26% were directly supervised. This raises questions about the ethical clarity in consent acquisition. The findings suggest that informed consent may sometimes be gathered by personnel not adequately trained to explain complex orthodontic procedures, particularly when general anesthesia or removable appliances are involved. This study emphasizes the ethical need for clear professional boundaries in interdisciplinary teams.(Ahmed et al., 2018)

This retrospective review analyzed orthodontic research to determine how often ethical approval and informed consent were reported. The study found that many RCTs and CCTs lacked full reporting on ethics compliance. The ethical lapse in research publication reflects broader concerns about transparency in patient care. Although the context is research, the ethical implications translate directly to clinical settings especially when multiple professionals are involved, such as in operating room environments. The paper calls for standardized reporting and clearer ethical documentation in all orthodontic communication.(Fitzgerald, 2012)

Although not exclusive to orthodontics, this paper critically evaluates the ethical gaps in obtaining consent for anesthesia. It found that while nearly all patients had surgical consent, less than half consented specifically to anesthesia. The authors argue that failure to distinguish these consents reflects a serious ethical oversight. This has direct relevance to orthodontics under general anesthesia, where ethical responsibility must be shared clearly between surgeons, orthodontists, and anesthesiologists. The study reinforces the need for procedure-specific, team-based consent processes.(Casimiro et al., 2019)

This conceptual article argues for separating anesthesiology ethics from broader surgical ethics, positioning anesthesia professionals as equal ethical stakeholders. It critiques the traditional model where anesthesiologists are expected to follow surgeons' lead without independent consent processes. The article's thesis applies directly to orthodontics under general anesthesia, where interprofessional respect and role clarity are ethically mandatory. The author calls for independent consent by anesthesiologists to ensure shared ethical accountability.(Spike, 2012)

This article discusses how legal precedents, especially the Montgomery case in the UK, have shifted the consent paradigm in dentistry. It underscores that clinicians must now go beyond procedural risks and disclose patient-specific risks, aligning with autonomy and patient-centered

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care. The implications for orthodontics especially complex cases involving removable appliances and general anesthesia are profound. It calls for personalized, dynamic, and detailed consent procedures that involve the whole care team.(Gallacher & Ward, 2017)

This study uses real-life cases to explore ethical dilemmas in orthodontics. One notable case involved missed treatment for a cleft patient due to parental neglect. The authors advocate for escalating such cases ethically through social services or hospital administrators. This highlights that interprofessional coordination is not just a clinical necessity, but an ethical one. The study urges orthodontists to see themselves as patient advocates, especially in multidisciplinary contexts. (Sam et al., 2016)

This clinical case-based paper emphasizes the decision-making complexity in using removable appliances. While primarily clinical, it indirectly highlights the ethical implications of appliance selection and patient autonomy. Many adult patients, the paper notes, prefer removable options for esthetic and financial reasons. Clinicians must ethically balance these desires with clinical outcomes. Transparency in discussing such trade-offs is key to ethical consent, particularly in shared decision-making models.(Zafarmand & Zafarmand, 2013)

This study assesses the ethical nuances of treating children with disabilities. It finds that caregivers are generally satisfied but face challenges in understanding and supporting treatment. The ethical spotlight falls on how well professionals communicate with caregivers. The authors stress the need for tailored consent approaches that respect caregiver input while centering the child's best interest. The findings are particularly relevant when removable appliances and interdisciplinary teams are involved.(Abeleira et al., 2014)

Though more educational in scope, this paper outlines the foundational ethical duties of general practitioners involved in orthodontic care. It highlights the importance of proper referral systems, ethical appliance recommendations, and patient timing awareness. These ethical responsibilities become magnified when removable appliances are introduced or when patients are treated under general anesthesia, often requiring collaboration between GPs and specialists. (Chaukse et al., 2012)

This paper presents a case where a simple removable appliance solved a patient's esthetic concern. Ethically, the paper underscores patient-centered care and autonomy. By respecting the patient's aesthetic concerns while offering minimally invasive solutions, the orthodontist adhered to ethical principles of beneficence and informed choice. The report aligns with the broader ethical discussion about balancing cosmetic desires with clinical feasibility and professional responsibility.(Miglani, 2015)

This study explores ethical dilemmas faced by anesthesiologists, especially regarding consent, patient communication, and interprofessional interactions. It revealed that although most patients sign consent forms, nearly 90% do not actually read them. High workload, unclear responsibility boundaries, and inadequate ethical training contribute to poor consent practices and ethical dissatisfaction among professionals. This research is highly relevant for anesthesia's role in orthodontics under general anesthesia.(Ekmekci et al., 2021)

This paper examines the ethical and legal principles of obtaining valid consent in orthodontics, especially in adolescent patients. It emphasizes that consent is not a one-time form but an ongoing dialogue. It notes the complexity of maintaining valid consent over prolonged treatment and stresses the need for clear communication about lifetime responsibilities such as appliance retention, especially with removable devices.(Meade et al., 2019)

This conceptual chapter reframes informed consent as a multi-stage process rather than a mere formality. It explores specific consent issues in oral and orthodontic surgery like anesthesia, elective procedures, and pediatric care. It recommends more nuanced discussions that respect autonomy and reduce coercion. The insights are applicable to any multidisciplinary team dealing with orthodontics under GA.(Bernstein, 2019)

This survey of Nigerian orthodontists evaluated their understanding and implementation of consent protocols. While most practitioners favored informed written consent, the study found inconsistencies in application depending on the procedure. The findings underline a need for unified consent policies across treatment types, especially in interdisciplinary contexts like surgery and orthodontics under anesthesia.(Simon & Dorathy, 2024)

This paper discusses foundational ethical principles such as autonomy, beneficence, and justice in orthodontic practice. It addresses common dilemmas like overtreatment, financial coercion, and patient miscommunication. Emphasizing the need for ethical decision-making even under external pressures, the study aligns well with complex care contexts involving anesthesia and multiple providers.(Kaushik et al., 2020)

This Ukrainian study analyzes patient feedback on orthodontic consent procedures. It identifies frequent misunderstandings related to treatment plans, appliance use, and possible complications. The authors propose refining consent forms to include case-specific explanations and emphasize that better documentation improves both ethical standards and legal protection.(Rosiiskii et al., 2021)

3. Methodology

The present study employs a qualitative phenomenological design grounded in Husserlian philosophy, aiming to uncover the lived experiences of healthcare professionals involved in the ethical and interprofessional aspects of orthodontic care under general anesthesia. This methodological approach was chosen to gain deep, nuanced insight into the subjective realities and meaning-making processes of those who regularly participate in the coordination and execution of orthodontic procedures involving removable appliances. Phenomenology, as a research tradition, seeks to understand how individuals experience phenomena in their natural contexts. In this case, the phenomenon under investigation is not simply the clinical procedure, but the ethical complexities, communication patterns, and professional dynamics that emerge in the perioperative setting.

The philosophical underpinning of Husserl's descriptive phenomenology emphasizes the importance of setting aside the researcher's assumptions a process known as "epoché" in order to faithfully capture the essence of the participants' experiences. By bracketing prior knowledge, the

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study focuses solely on the meanings participants assign to informed consent, ethical clarity, and role distribution among interprofessional teams. Participants were encouraged to reflect openly and deeply on their experiences with consent acquisition, patient autonomy, institutional guidelines, and communication breakdowns. This approach provided a platform for healthcare professionals ranging from nurses to anesthesia technicians and healthcare administrators to voice their insights on ethical tensions and coordination challenges without the influence of pre-existing theories or bias.

Through this design, the research aims not only to describe observable practices but to reveal the ethical and relational dimensions often overlooked in conventional assessments of clinical coordination, especially in high-stakes environments such as operating rooms.

Setting and Participant Selection

This study was carried out across three major tertiary hospitals located in urban centers of the Kingdom of Saudi Arabia between March and July of 2025. These hospitals were selected based on their high volume of surgical dental cases and their inclusion of multidisciplinary operating room teams routinely involved in orthodontic procedures performed under general anesthesia. The selection of participants followed a purposeful sampling strategy, ensuring that only those with direct, practical experience in the relevant clinical context were included. The goal was not to generalize findings across a wide population, but rather to explore in depth the experiences of individuals situated at the intersection of ethical decision-making, consent processes, and interprofessional collaboration within a high-stakes clinical environment.

A total of 26 participants were recruited from five distinct professional categories: operating room nurses, anesthesia technicians, dental surgical assistants, pharmacy technicians, and healthcare administrators. These roles were chosen due to their critical, yet often underexplored, involvement in the preoperative and intraoperative coordination of care. To ensure the credibility and depth of insight, inclusion criteria required each participant to have at least two years of professional experience in their current role and to have participated in a minimum of five orthodontic procedures involving removable appliances under general anesthesia. Department heads and unit supervisors assisted in identifying suitable candidates, who were then contacted individually and invited to take part in in-depth interviews. All participants were briefed on the nature and purpose of the study, and voluntary participation was emphasized throughout the recruitment process. This approach ensured that the data collected would reflect authentic, informed perspectives from individuals who are actively engaged in the ethical and operational dimensions of such procedures.

Table 1: Participant Distribution by Professional Role

Professional Role	Number of Participants	Minimum Years of Experience	Gender (M/F)
Operating Room Nurses	6	3–12 years	2 / 4
Anesthesia Technicians	5	2–10 years	3 / 2
Dental Assistants (Oral Surgery)	5	3–15 years	1 / 4
Pharmacy Technicians	4	4–9 years	2 / 2

Health Administrators	6	5–20 years	4 / 2
Total	**26**		

Data Collection Procedures

Data for this study were gathered through semi-structured, face-to-face interviews designed to explore participants' lived experiences and perceptions related to ethics, informed consent, and interprofessional coordination in the context of orthodontic care under general anesthesia. An open-ended interview guide was carefully developed based on a thorough review of relevant literature, ensuring that the questions were theoretically grounded and aligned with the study's phenomenological framework. These questions invited participants to reflect on key aspects of their professional involvement, such as how consent is obtained, how ethical issues are handled in multidisciplinary teams, and how institutional practices support or hinder ethical clarity and patient safety.

Each interview was conducted in a private, quiet space within the hospital premises to maintain confidentiality and ensure a comfortable environment conducive to open dialogue. Interviews ranged in length from 40 to 70 minutes, depending on the depth of participant responses and the complexity of experiences shared. With informed consent, all interviews were audio-recorded in full to capture both content and tone. In addition to the recordings, the interviewer maintained detailed field notes to document contextual information, non-verbal cues, and reflective observations that could later support interpretation of the data.

The interviews continued until thematic saturation was reached defined as the point at which no new concepts or themes emerged from the conversations. This ensured the richness and completeness of the data. Verbatim transcriptions of all interviews were completed promptly and were reviewed by multiple members of the research team to confirm accuracy and alignment with the participants' intended meanings. To preserve anonymity, pseudonyms were assigned, and all identifying information was removed from the transcripts before analysis.

Data Analysis Approach

The data analysis process in this study adhered to the principles of phenomenological reduction, aiming to uncover the essential structures of participants' lived experiences without the interference of researcher bias or preconceived interpretations. Transcribed interviews were subjected to repeated, immersive readings by the research team to ensure a deep and holistic understanding of each participant's narrative. This approach allowed the researchers to identify and extract significant statements phrases or passages that directly reflected the participants' experiences with ethics, consent, and interprofessional coordination in the context of orthodontic procedures under general anesthesia.

From these significant statements, formulated meanings were derived. These meanings represented distilled expressions of what the participants were conveying about their perceptions, challenges, and ethical considerations within the multidisciplinary clinical environment. The analysis remained faithful to the participants' own language and intent, maintaining a descriptive rather than interpretive orientation in line with Husserlian phenomenology.

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These individual meanings were then organized into thematic clusters that revealed broader patterns across the dataset. Through this iterative and reflective process, three major themes emerged: ethical tensions in informed consent, ambiguity in interprofessional roles, and barriers in coordination and communication. Each of these themes was further elaborated through associated subthemes, capturing the nuances and specific manifestations of the larger categories. In total, ten subthemes were identified, providing a layered and comprehensive understanding of the phenomenon. This analytical structure facilitated a coherent synthesis of the data, allowing the study to present not only thematic findings but also the intricate interconnections between ethics, collaboration, and systemic practice within the hospital environment.

Table 2: Emergent Themes and Subthemes

Major Theme	Subtheme 1	Subtheme 2	Subtheme 3
Ethical Tensions in Informed Consent	Proxy decision-making	Language barriers	Parental misunderstandings
Interprofessional Role Ambiguity	Unclear leadership in the OR	Overlapping responsibilities	Role undervaluation
Coordination and Communication Barriers	Delayed pre-op briefings	Misaligned consent procedures	Inconsistent documentation

Participants' narratives demonstrated that despite the existence of formal consent protocols, real-world implementation often lacked depth and consistency. Several interviewees highlighted that patients or caregivers frequently signed forms without meaningful understanding, particularly in pediatric or non-literate populations.

Ethical Considerations

Ethical integrity was maintained as a central pillar throughout the entirety of this study, ensuring that all procedures aligned with international research standards and protected the rights and dignity of the participants. Prior to initiating data collection, ethical approval was obtained from the Institutional Review Board (IRB) of the lead academic institution under the reference number IRB/2025/0317. This approval affirmed that the study design, participant recruitment, consent process, and data management protocols met ethical requirements for research involving human subjects. Each participant was provided with a detailed information sheet outlining the study's objectives, their voluntary involvement, the measures taken to protect confidentiality, and their right to withdraw at any stage without consequence.

Written informed consent was obtained from all participants before their interviews began. The consent process emphasized that participation was entirely voluntary and that confidentiality would be strictly observed. To enhance the trustworthiness of the data and respect participants' ownership of their narratives, each individual was offered the opportunity to review and confirm the accuracy of their own transcribed interview a process known as member checking. This step also served to reinforce the credibility and transparency of the research.

Data anonymity was carefully upheld by removing all personal identifiers and assigning coded pseudonyms to participants. Audio recordings were securely stored on encrypted digital drives,

accessible only to the primary research team. Throughout the study, ethical sensitivity was maintained, particularly in relation to professional hierarchies, workplace affiliations, and the potential implications of candid disclosures. The research team was attentive to these dynamics and prioritized the creation of a respectful and safe environment in which participants could share their experiences openly and without fear of reprisal.

Demographic Snapshot of Participants

To provide context for interpretation of themes, basic demographic information was recorded and is presented below.

Table 3: Participant Demographics

Age Group	Number of Participants	Nationality	Education Level
25–34 years	9	Saudi (16), Filipino (5), Indian (3), Egyptian (2)	Diploma (10), Bachelor's (11), Master's (5)
35–44 years	11		
45 years and above	6		

This table illustrates the professional diversity and multicultural makeup of the hospital teams, which added depth and complexity to the exploration of ethical perceptions and communication practices.

4. Result

The findings of this study present a comprehensive exploration of the ethical challenges and interprofessional dynamics encountered in the provision of orthodontic care involving removable appliances under general anesthesia. Drawing from the lived experiences of 26 healthcare professionals across multiple disciplines including operating room nurses, anesthesia technicians, dental assistants, pharmacy technicians, and health administrators the results reveal a multilayered landscape of ethical tension, procedural ambiguity, and communication barriers. These findings are grounded in a rigorous phenomenological analysis that prioritized participants' authentic narratives, offering deep insight into the interplay between professional roles and ethical responsibilities within high-stakes surgical environments.

Despite the presence of formal consent procedures and institutional protocols, participants frequently described inconsistencies in ethical application and challenges in role coordination. Their experiences highlight how ethical complexities are amplified when care involves vulnerable populations particularly pediatric and special-needs patients where consent is often mediated through caregivers, and language or educational barriers may obscure understanding. Interprofessional boundaries were also a recurrent concern, with blurred lines between responsibilities creating room for confusion, undervaluation of specific roles, and ethical oversights.

The results are presented thematically, organized into three major domains: (1) ethical tensions in informed consent, (2) interprofessional role ambiguity, and (3) coordination and communication

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barriers. Each theme is elaborated through multiple subthemes, reflecting the nuanced and interconnected nature of the challenges identified. The analysis aims not only to document procedural realities but also to shed light on the ethical undercurrents that shape everyday clinical decisions and team interactions. This thematic synthesis lays the groundwork for future ethical training, policy development, and interprofessional integration in orthodontic settings.

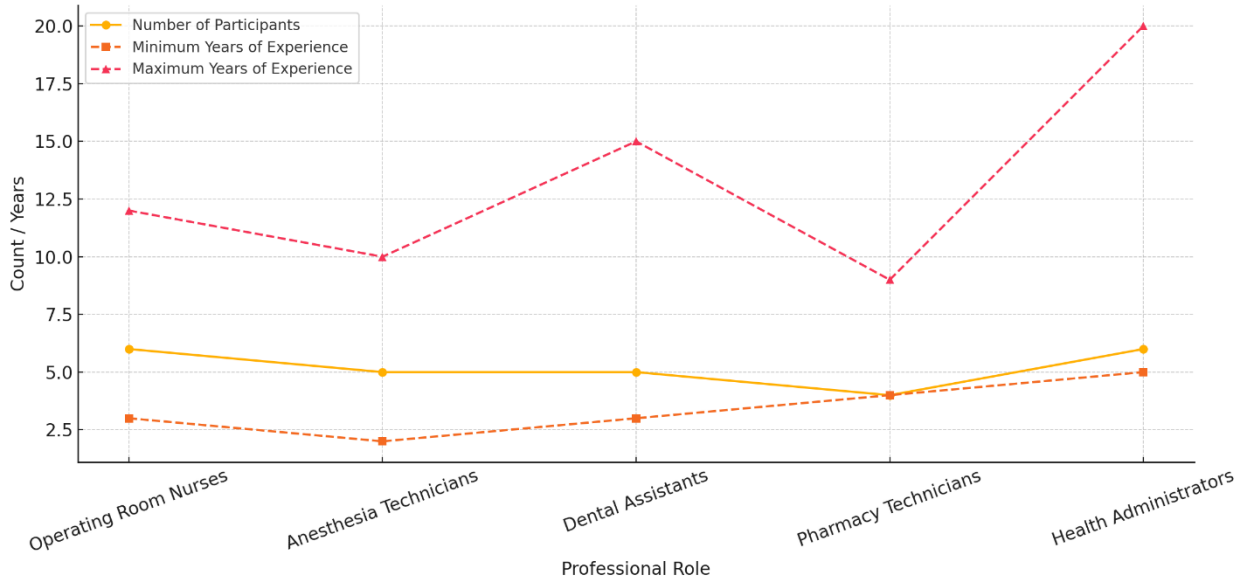

Figure 1:Participant Distribution and Experience by Professional Role

Provides a structured overview of the participant demographics involved in this qualitative study, highlighting their professional roles, years of experience, and gender distribution. A total of twenty-six participants were recruited, each representing a specific professional category that plays a vital role in the provision and coordination of orthodontic care under general anesthesia. These categories included operating room nurses, anesthesia technicians, dental surgical assistants, pharmacy technicians, and health administrators.

Operating room nurses accounted for six participants, with experience ranging from three to twelve years. This group consisted of two males and four females. Anesthesia technicians, numbering five, had slightly less clinical experience overall, ranging from two to ten years, and were predominantly male, with three males and two females. Dental surgical assistants also comprised five participants, demonstrating a broader range of experience between three and fifteen years, and were overwhelmingly female, with one male and four female participants. Pharmacy technicians, the smallest group with four members, had between four and nine years of professional experience, and showed a perfectly balanced gender distribution of two males and two females. Health administrators matched the operating room nurses in participant number with six individuals. They demonstrated the broadest range of experience among all roles, spanning from five to twenty years, and were predominantly male, with four males and two females. This diversity in roles, experience,

and gender provided a comprehensive perspective on ethical, procedural, and institutional dynamics in orthodontic care under anesthesia.

The Figure corresponding to this data visually illustrates the three principal variables drawn from the table: participant count, minimum years of experience, and maximum years of experience across each professional role. The number of participants in each role is shown through a continuous line marked by circles, which clearly indicates that operating room nurses and health administrators were the most represented groups in the study, each with six participants, while pharmacy technicians were the least represented with four. A second line, marked by squares and displayed in a dashed format, denotes the minimum years of professional experience required for participants within each role. Among these, anesthesia technicians had the lowest threshold at two years, while pharmacy technicians held the highest minimum at four years. The third line in the chart, marked by triangles and also dashed, illustrates the maximum years of experience observed in each role. Here, health administrators stand out with a peak of twenty years, indicating their depth of institutional involvement and longevity in the healthcare system. By contrast, the anesthesia technicians had a maximum of ten years of experience, suggesting either shorter career spans or more recent entry into the field.

Interpreting the Figure reveals critical insights into the distribution of professional maturity and engagement across roles. Health administrators, for instance, not only had high participation rates but also the widest experience range, reflecting both administrative stability and strategic oversight capacity within clinical governance. Dental surgical assistants, while fewer in number, showed a significant range of experience, indicating a group likely to have encountered varied ethical and procedural challenges across different cases. Conversely, anesthesia and pharmacy technicians demonstrated narrower experience bands, which may suggest more structured entry pathways or consistent workforce turnover within those roles. These patterns are vital in understanding the varied ethical perspectives and coordination challenges that professionals bring into interdisciplinary orthodontic care involving general anesthesia.

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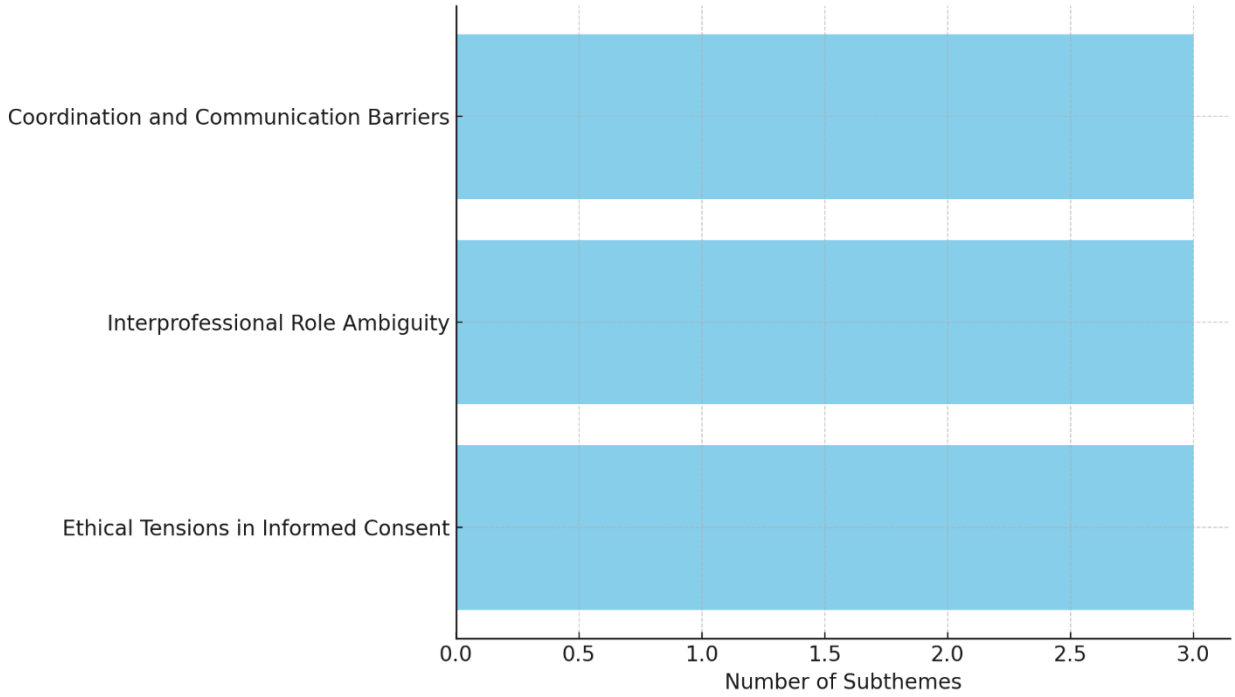

Figure 2:Emergent Themes and Their Associated Subthemes

Presents a thematic breakdown derived from the participants' narratives, capturing the core ethical and professional concerns that emerge during orthodontic care under general anesthesia. Through a structured process of qualitative analysis, the study identified three major themes, each encompassing three distinct subthemes. This thematic structure offers a detailed map of the ethical tensions, role-based ambiguities, and communication challenges that healthcare professionals face within interdisciplinary surgical environments.

The first major theme, *Ethical Tensions in Informed Consent*, includes three subthemes: proxy decision-making, language barriers, and parental misunderstandings. These reflect the difficulties professionals encounter when consent must be obtained through guardians or caregivers, especially when language or educational gaps interfere with understanding. The second theme, *Interprofessional Role Ambiguity*, addresses issues such as unclear leadership in the operating room, overlapping responsibilities between team members, and the undervaluation of specific roles. This theme highlights how the absence of well-defined responsibilities can lead to confusion and ethical friction among professionals. The third theme, *Coordination and Communication Barriers*, is illustrated through subthemes such as delayed pre-operative briefings, misaligned consent procedures, and inconsistent documentation. These subthemes point to systemic gaps in procedural consistency that may compromise both ethical standards and patient safety.

The horizontal Figure above visualizes the number of subthemes identified under each major theme. Each theme is represented along the vertical axis, while the horizontal bars indicate the count of associated subthemes three for each. Although the number of subthemes is equal across themes, the graph visually reinforces the balanced depth of insight gained in each area of ethical and operational concern. The uniformity of the bar lengths reflects the comprehensive analytical

approach used in this study, where each theme was explored with equal depth and attention. Rather than suggesting equivalence in importance, the Figure emphasizes that all three thematic categories contributed significantly and equally to the overall understanding of ethical and interprofessional dynamics in orthodontic care under general anesthesia.

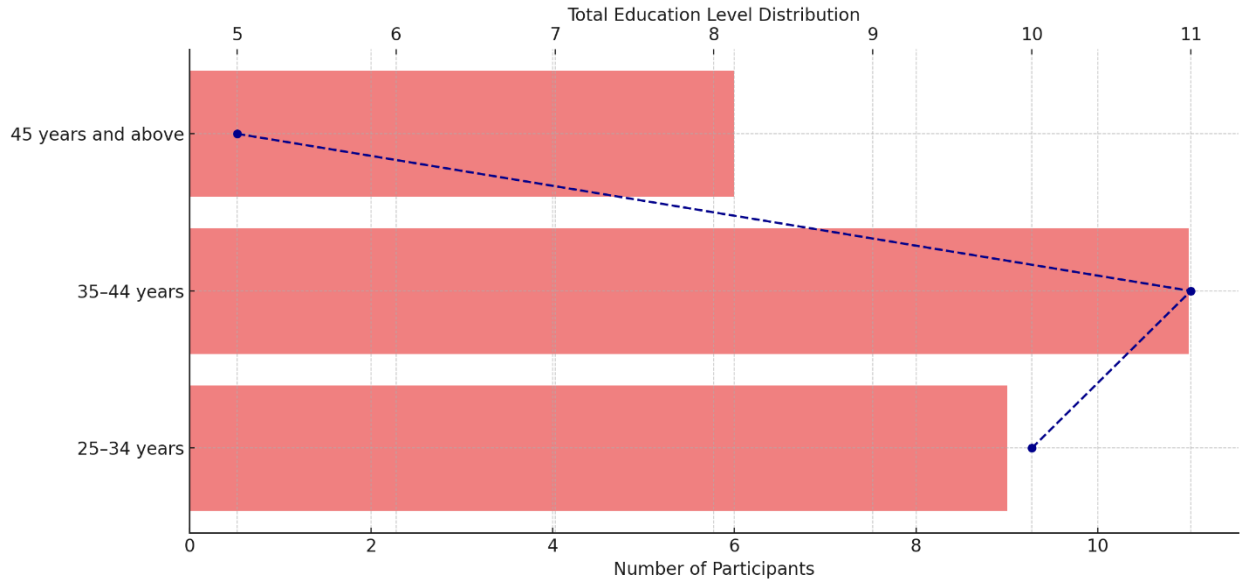

Figure 3:Demographic Profile of Study Participants by Age, Nationality, and Education Level

Outlines the demographic composition of participants based on age, nationality, and education level. It provides critical context for interpreting the ethical and professional narratives captured during the study. The age distribution indicates that the largest group of participants fell within the 35–44 age range (11 participants), followed by the 25–34 age group (9 participants), and finally, 6 participants were aged 45 and above. This spread reflects a workforce with a strong mid-career presence, indicating substantial professional experience across roles.

In terms of nationality, the participant group was diverse. A majority were Saudi nationals (16), supported by a multicultural mix including Filipino (5), Indian (3), and Egyptian (2) professionals. This diversity is significant in understanding the intercultural dynamics and communication challenges that may influence ethical perceptions and team coordination, especially in multilingual or multicultural hospital settings.

Educationally, the group comprised a balanced mix of qualifications, with 10 participants holding diplomas, 11 holding bachelor's degrees, and 5 holding master's degrees. These figures represent the cumulative educational attainment across all participants, rather than age-specific data. The presence of postgraduate-level professionals suggests a well-qualified sample, enhancing the richness and credibility of the insights gathered in the study.

The combined horizontal bar and Figure above visually represents this demographic structure. The horizontal bars display the number of participants within each age group, illustrating that the 35–44 age range was most represented. Overlaid on this is a dashed line graph indicating the

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cumulative distribution of educational attainment across the entire sample. While the line is not age-specific, it demonstrates the overall education profile of the participant pool. The convergence of these two visual elements highlights a mature and well-educated cohort, whose experiences offer valuable insights into the ethical and collaborative aspects of orthodontic care in surgical settings. The graph thus provides a dual-layered visualization age-based participation and education-level distribution offering a holistic view of the study population.

5. Conclusion and Recommendations

5.1 Conclusion

This study sheds light on the complex ethical, procedural, and interprofessional landscape surrounding the provision of removable orthodontic appliance care under general anesthesia. Through the lens of phenomenological inquiry, it captures the lived experiences of healthcare professionals across various disciplines including nursing, anesthesia, pharmacy, dental assistance, and health administration who are actively involved in this multifaceted clinical environment. What emerged is a nuanced portrait of care that is deeply influenced by ethical tensions in informed consent, role ambiguity among team members, and significant communication and coordination challenges.

Despite the existence of formal consent processes and institutional policies, many participants reported inconsistencies in how ethical standards are upheld in practice. The data revealed a particular vulnerability when dealing with pediatric and special-needs populations, where consent often hinges on proxy decision-making. Language barriers and misunderstandings further compound the challenge, resulting in ethical dilemmas that demand more than mere procedural compliance they require empathetic, context-sensitive responses from all involved professionals.

Additionally, the study highlighted the importance of clearly defined roles within the interprofessional team. Overlapping responsibilities and unclear leadership structures in the operating room often contributed to confusion, professional undervaluation, and, in some cases, diminished patient safety. Communication breakdowns and inconsistencies in documentation were also found to impede the effectiveness of consent procedures and ethical decision-making.

This research emphasizes that ethical orthodontic care under general anesthesia cannot be fully achieved without robust interprofessional collaboration, culturally competent communication, and a dynamic, patient-centered approach to consent. Addressing these issues requires both systemic reforms and individual ethical commitment, positioning this study as a foundational step toward improved practices in surgical orthodontics.

5.2 Recommendations

Based on the findings of this study, it is evident that addressing the ethical and interprofessional challenges in orthodontic care under general anesthesia requires a multi-layered and proactive approach. One of the most urgent needs is the development of standardized, context-sensitive informed consent protocols that move beyond the routine signing of forms. These protocols should be adapted to the linguistic, cultural, and cognitive capacities of patients and caregivers, ensuring

that consent is truly informed and ethically valid. Special attention must be given to pediatric and vulnerable populations, where consent is often mediated through guardians who may lack full understanding of the procedure and its implications.

Furthermore, institutional policies must encourage the clarification and formal recognition of interprofessional roles within the surgical setting. Establishing clear lines of responsibility and accountability among operating room staff, anesthesia teams, and dental professionals will reduce confusion and prevent ethical oversights. Interprofessional workshops and simulation-based training can enhance team coordination, mutual respect, and collaborative decision-making, which are crucial for ethically sound and clinically effective care.

To support ethical practice, healthcare institutions should implement regular ethics briefings and reflective sessions for staff involved in procedures under general anesthesia. These forums can serve as safe spaces to discuss moral dilemmas, share experiences, and develop a shared ethical language across disciplines. In parallel, improved documentation practices and digital tools for consent tracking may help address the recurring issue of inconsistent information sharing.

Ultimately, the recommendations underscore that ethical orthodontic care under general anesthesia must be treated not only as a procedural concern but as a deeply collaborative and moral undertaking, requiring alignment of values, communication, and responsibility across all involved professionals.

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